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ABSTRACT

The "Test of Economic Literacy" was used to assess the economics knowledge of students enrolled in five Kentucky vocational high schools. The test was to determine if economics instruction should be instituted in vocational schools. Neither age group nor gender was found to be a significant factor in student achievement, but the number of relevant courses taken and the academic track followed by the student were found to affect performance. Only four of the 46 questions asked were answered correctly by more than 50% of the students. Although reading and reasoning skills may have contributed to this, a lack of economics knowledge is definitely indicated. The study recommends that a random sample of comprehensive high schools in Kentucky be tested; moreover, a review of the curricula should be conducted. Possible courses of action include: workshops in economics for inservice teachers; requiring preservice teachers to complete one course in economics; requiring a 6-week course in economics for all high school students. A sample test with a discussion, rationale, and percent answering incorrectly is appended. (YLB)

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ASSESSMENT OF THE LEVEL OF ECONOMIC UNDERSTANDING OF STUDENTS ENROLLED IN VOCATIONAL SCHOOLS IN REGION IX

by

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by

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CONTENTS

CHAPTER

I. THE PROBLEM 1

Introduction
Statement of the Problem
Purpose of the Study
Need for the Study
Delimitations
Definition of Terms

II. REVIEW OF LITERATURE 5

III. PROCEDURES 15

IV. THE TEST OF ECONOMIC LITERACY 18

Test Content
Value of the Test
Norming Sample Statistics

V. FINDINGS 22

Group Differences
Test Results
General Linear Models Procedures and
Tukey's Studentized Range (HSD) Test

VI. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS 35

Summary
Conclusions
Recommendations

APPENDIXES

BIBLIOGRAPHY

CHAPTER I

THE PROBLEM

Introduction

If individuals in our society are to function efficiently and effectively as producers, consumers, and voters, there are certain economic truths which they should understand. Our public school system must be responsible for teaching those basic economic facts which will enable students to acquire the concept to prepare them to become knowledgable citizens.

There has not been an overwhelming amount of research conducted in Kentucky concerning the economic understanding of secondary students. That which has been completed paints a less-than-rosy picture with regard to the economic education of the Commonwealth's youth.

With this fact in mind, it was deemed appropriate to propose a project for funding through the Research and Development Unit, Bureau of Vocational Education, Kentucky Department of Education, for the purpose of beginning a comprehensive study of student understanding of basic economic concepts.

Statement of the Problem

The problem involved in this study was the evaluation of the level of economic understanding of students enrolled in the five vocational education schools in Region IX. All students enrolled in the

programs at the various schools who were present the day the test was administered became part of the population used in the study. The Test of Economic Literacy, produced by the Joint Council on Economic Education, was used for the assessment. An effort was made to compare the level of economic understanding of the students in the study with the national norm which had been achieved on the assessment instrument.

Purpose of the Study

The purpose of the study was to ascertain the level of economic understanding of vocational education study in Region IX. If the data indicated a significant lack of economic understanding as measured by the national norm on the Test of Economic Literacy, the Bureau of Vocational Education would be asked to consider instituting some type of economic education, either as a separate or integrated course, in all vocational programs.

Need for the Study

During the past few years, two studies were conducted by graduate students at Morehead State University with regard to the level of economic understanding of students.

Duvall tested the sophomores, juniors, and seniors at Walton Verona High School in 1980, using the 1964 edition of the Test of Economic Understanding, published by the Joint Council on Economic Education. The purpose of the assessment was to determine if the level of economic understanding at that institution merited the inclusion of an economics course as a requirement at Walton Verona High School.[1]

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[1]Duvall, Donna, Economic Understanding of Senior High Students at Walton Verona High, Unpublished Independent Study, Morehead State University, 1980.

Morrison conducted a study of 113 first-semester freshmen at Morehead State University in 1976 to measure their level of economic understanding. At that time, the Test of Economic Understanding was also used as the assessment instrument for the study.[2]

Both the Morrison study and the Duvall study found a decided lack of understanding of basic economic concepts.

Inasmuch as the new pre-college curriculum has made no provision for the teaching of economics at the secondary level, as a required course, and the vocational education program in the state offers only one course, Business Economics, which is not a requirement, it was believed that a comprehensive study was needed to provide evidence of a need to reevaluate the curriculum for secondary students.

Delimitations

The testing was confined to those students enrolled in programs being taught in the vocational education schools in Region IX. Students who were present on a particular day when the test was scheduled at a specific school were tested.

Definition of Terms

Economic literacy is a term which has recently been used as a substitution for the term "economic understanding" or what people know about economic concepts, how to apply them, how to analyze them, and how to weigh alternatives. In this instance it refers to the measurement of knowledge with regard to economic concepts which should be taught in secondary schools.

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[2]Morrison, Betty, The Economic Understanding of First-Semester Freshmen, Morehead State University, Fall, 1976, Unpublished Thesis, Morehead State University, 1976.

Relevant courses refers to six courses which were listed on the questionnaire which each student was asked to complete as he/she was tested. The student was asked to check whether he/she had taken the following courses: General Business, General Math, Algebra I, Algebra II, Consumer Education, or Economics. Since these courses help to develop logic and economic understanding, it was believed that a student would achieve a higher score if one or more had been completed as a part of the curriculum.

Mean refers to the sum of the scores included in a frequency distribution, divided by the total number of students tested.

Median is the division point on the scale of values above and below which 50 percent of all scores fall.

Norms are measures of performance which are considered typical for certain groups. The term is used to indicate expected performance.

Standard deviation is a measure of the scatter of scores in a frequency distribution around the mean. If a distribution is normal, ± 1 standard deviation will include approximately 68.27 percent of the total scores. A small numerical value indicates the frequency distribution is relatively homogeneous; a large standard deviation indicates a heterogeneous distribution.

CHAPTER II

REVIEW OF LITERATURE

Individuals seem to have been conditioned to think of the term "economics" as being descriptive of a discipline or subject which is best left to the experts and one which is of minimal interest to our society as a whole. It is, however, simply a social science which deals with the way in which a nation makes use of its natural resources and the problems generated by a given economic system in allocating those resources.

Students need to understand that a nation must make decisions concerning the use of limited resources just as a consumer must make decisions regarding the use of limited income. The subject matter contained in an economics course is essentially simple and can be taught in a manner which is easily understood by secondary students. If we are to increase the level of economic literacy in our state and nation, it is a course which must be taught at the secondary level.

Perhaps it is a matter of the public school system being convinced of the importance of economics to those who are preparing for a life role in our society. Importance is, of course, relevant; however, when we consider that the preservation of our own way of life is at stake in the continuing clash of major ideologies in our world, and since our very continuation as a society may well be determined by

economic factors, the weight which we apply to the importance of economics may assume added value.

Current research shows that much more emphasis needs to be placed on economic education in our nation. In 1979 the National Assessment of Educational Progress completed a study of 4,300 students. In the student, entitled Teenage Consumers: A Profile, the researchers indicated serious shortcomings among teenagers in the areas of economics and consumer behavior and protection. To further add to their concerns was the lack of mathematical skills needed for making calculations for consumer decisions. Among their findings were:

--Only 14 percent of the 4,300 surveyed were aware that a person most likely to benefit during a period of inflation would be a homeowner with a long-term mortgage.

--About 50 percent did not realize that persons on fixed incomes would be hurt most during inflationary periods.

--Twenty percent did not believe that business would become more efficient through competition.[4]

In a national survey conducted in 1979 by the Joint Council on Economic Education, 1,817 students were polled. Some of the findings were:

--Approximately 81 percent were not aware that having more of any one thing meant giving up something else.

--Seventy percent did not know that the major cause of low income in our country was the result of lack of educational and

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[4]John E. Clow, "The Impact of Economic Education on Basic Business," Revitalization of Basic Business Education at All Instructional Levels (Reston, Virginia: National Business Education Association, 1982), p. 36.

technical skills.

--About 56 percent did not know that high wages in a market economy are largely dependent on productivity of the worker.

--Almost 70 percent did not know that in order to insure economic growth, there must be increased investment.

--Approximately 45 percent did not know the function of money.[5]

There are two approaches to teaching economic concepts to studen (1) as a separate subject, or independent economics course; and (2) as part of another subject, sometimes referred to as the infusion approach. If taught as a separate subject, very few students are reached--perhaps as few as four percent of all secondary students. When taught as part o another subject, concepts are taught in a random fashion.

> "There is disturbing evidence that when students are exposed to economic instruction through a K-12 infusion approach, they do not acquire an overview of how individual concepts fit together into a meaningful whole."[6]

As of 1980, 29 states mandated the teaching of economics. Kentucky was among those states, mandating that consumer education be taught K-12, using the infusion approach. Consumer education deals primarily with the development of skills necessary to make informed decisio in purchasing goods and services; the laws, rights, and avenues of recourse for the consumer in the marketplace; and the citizens' role in ou society as a consumer. This course does not necessarily address the total problem of economic literacy.

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[5]Economic Illiteracy: Can We Afford It Any Longer? (New York: Joint Council on Economic Education, 1979).

[6]William B. Walstad and Michael W. Watts, "Economics Instruction in our Schools," The Balance Sheet (Cincinnati: South-Western Publishing Company, March/April, 1985), p. 12.

Duvall's study of 194 sophomores, juniors, and seniors at Walton Verona High School in 1980 involved the use of the Test of Economic Understanding in assessing the level of economic literacy of those students. She found that:

--64 percent of the sophomores answered less than half the questions correctly.

--84 percent of the juniors answered less than half the questions correctly.

--52 percent of the seniors answered less than half the questions correctly.[7]

Morrison's study, involving 113 first-semester students at Morehead State University during the fall semester, 1976, found that:

--More than 80 percent of the participants had not taken an economics course in high school.

--Out-of-state students earned higher scores than the in-state students earned.

--Students who graduated from high schools with either very small or very large enrollments scored lower than those from the intermediate-size schools.

--Instruction in the secondary schools with regard to economic concepts was ineffective in instilling economic understanding in students.

--The level of economic understanding of entering freshmen at Morehead State University was well below the national norms for twelfth grade students who have never taken a course in economics.[8]

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[7]Duvall, op.cit.

[8]Morrison, op.cit.

In the National Survey of Economic Education, Grades Six through Twelve, copyrighted by Phillips Petroleum Company in 1981, it was reported that a significant effort has been made by public and private institutions and by corportations to improve the quality of economic education in our country. This obviously points out an expanding recognition of the importance of a basic understanding of our economic system by every citizen. Based on data obtained through the survey, it was suggested that "economics is approaching the status of a mainstream course of study in America's junior and senior high schools," although the teaching of economics is a secondary responsibility of most teachers and economics is still a subsidiary subject taught as a part of another subject. Those other subjects are usually U.S. History, U.S. Government, Social Studies, World History, Civics, American Studies, and World Geography.

The Joint Council on Economic Education indicates several basic economic concepts which are essential for students to understand if they are to be effective consumers, producers, and voters. If students are able to internalize those concepts through infusion or through an independent economics course, schools will have provided adequate economic preparation. Those concepts, which are tested in the Test of Economic Literacy (used as the assessment instrument for this study), are:

--The Basic Economic Problem
  Economic wants
  Productive resources
  Scarcity and choices
  Opportunity costs and trade-offs
  Marginalism and equilibrium

--Economic Systems
- Nature and types of economic systems
- Economic incentives
- Specialization, comparative advantage, and division of labor
- Voluntary exchange
- Interdependence
- Government intervention and regulation

--Microeconomics: Resource Allocation and Income Distribution
- Markets, supply and demand
- The price mechanism
- Competition and market structure
- "Market failures: information costs, resource immobility, externalities, etc.
- Income distribution and government redistribution

--Macroeconomics: Economic Stability and Growth
- Aggregate supply and productive capacity
- Aggregate demand: unemployment and inflation
- Real and money income; price level changes
- Money and monetary policy
- Fiscal policy: taxes, expenditures, and transfers
- Economic growth
- Savings, investment, and productivity

--The World Economy
- International economics

--Economic Institutions

--Concepts for Evaluating Economic Actions and Policies
- Economic goals: freedom, economic efficiency, equity, security, price stability, full employment, growth
- Trade-off among goals[9]

In 1962 the Department of Public Instruction, Commonwealth of Pennsylvania, issued a publication entitled The Universal Economic Problem: Suggested Procedures and Resources for a Minimum Course in Economics, after the State Council of Education mandated that instruction in economics would be required for graduation from senior high school, effective in 1964. A minimum of 36 hours, or approximately one-third of an academic unit, must be completed.

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[9]Soper, op. cit.

The State Council of Education outlined a suggested content to be taught in the Pennsylvania schools, divided into six units as follows:

--Unit One - An Introduction to Economics (1 to 2 hours)
- The Universal Problem of Scarcity
- The Need for Economizing
- A Variety of Ways of Economizing Which Have Been Tried
- Why Study Economics
- Economic Decision-making and Policy Choices Require Rational Analysis
- The Method of Economics

--Unit Two - The American Economy: Prices, Profits, Markets
- What Determines the Goods and Services Produced (5 to 8 hours)
- Labor Resources
- Capital Resources
- Natural Resources
- Entrepreneurship
- Production and Diminishing Returns
- Basic Institutions of a Private Enterprise Economy
- An Overview of a Competitive Market System
- Demand in a Competitive Market
- Supply in a Competitive Market
- Determination of Price and Production in a Competitive Market
- Changes in Supply and Demand
- Response to Profits
- Review of Major Implications of a Competitive Market Economic System
- Why Have We Not Relied Completely on a Competitive Market System to Make all Economic Decisions?
- Review of the Conditions Required for Effective Operation of a Competitive Market
- Monopoly and Quasi-monopoly
- Problem of Preserving Effective Competititon
- Nature of Competition in Our Economy

--Unit Three - Economic Growth (5 to 7 hours)
- What is Meant by Economic Growth; How Measured
- Facts About Economic Growth in the U.S.
- Factors Underlying Growth in Total National Economic Capacity
- Factors Underlying Growth in Aggregate Demand
- Comparison of the Problems Faced by the U.S. and Other Nations in Stimulating Economic Growth

--Unit Four - Causes and Effects of Business Cycles (5 to 7 hours)
- What are the Business Cycles and How Do They Affect People?
- Causes of Booms and Depressions
- How to Alleviate Booms and Depressions

--Unit Five - The Role of Government in Our Economy(5 hours)
- Extent of Government Concern and Involvement in Economic Activities in the U.S.
- Historically, Government Has Played an Ever-Widening Role from Colonial Times to the Present
- Regulatory Activities of Government Have Important Effects on the Allocation and Distribution of our Resources
- Types of Government Participation in Our Economy
- Government Soending Affects Allocation of Resources and Distribution of Income
- Objectives of Government Expenditures
- Federal, State and Local Government Budgets
- Financing Government Spending Through Taxation
- Economic Effects of Taxes
- Financing Government Spending-Borrowing
- Evaluating the Role of Government in Our Economy

--Unit VI - Comparison of Capitalist and Communist Economic Systems (6 hours)
- All Economic Systems Face Fundamentally the Same Big Problems
- Comparison of Ways in Which Capitalist and Communist Economies Solve Their Problems
- American Economy Success vs Communist Economy Success
- Economy Growth Since World War II

--Miscellaneous Units as Time Permits
- Nature of Business Organizations
- Understanding of Role of Labor Unions
- Understanding of Functions and Character of Money and Banking Systems
- How The U.S. Economy is Related to and Affects the World
- The Farmer and the Measures Tried/Proposed to Deal with Farms
- Distribution of Income in our Economy
- Analysis of Present and Probable Future Effects and Implications of Automation on the Economy
- How a Knowledge of Economics Can Help the Individual in Everyday Business of Living

Perhaps part of the problem involved in the amount of economic illiteracy among students in our country is the lack of adequate preparation of teachers. According to Walstad and Watts, national surveys indicate that most of the teachers of Economics have a limited knowledge of the subject and are not equipped to teach it either as a separate course or through the infusion method. They suggest that teachers need at least five semester courses to obtain adequate economic understanding needed for teaching.

Further, Walstad and Watts reported that 50 percent of all elementary teachers polled in surveys had completed no course work in economics, and 25 percent had taken only one course. Ten to 20 percent of secondary teachers using the infusion method had no economics course, 25 percent had one course, and 30 percent had two courses.[10]

Among the recommendations made by the Pennsylvania State Council of Education were that those teachers who were best qualified would be selected to teach the economics courses, preferably those with a major or minor in economics; and further that those teachers be urged to take economics courses beyond the baccalaureate degree and to take refresher courses and workshops during the summers.

The Council felt that teachers fail to develop economic understanding through failure to stimulate thought. For example, if discussion of an economic problem were raised in a class, too often a teacher would state his/her belief rather than an answer. Students must be encouraged to think objectively about economic problems, basing decisions upon reason and values.

To further substantiate the need for adequate teacher preparation, the Southern Regional Education Board has called for strenghening the content area of the programs for the teacher education majors in our universities. The Board specifically called for more preparation in economics.[11]

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[10]Walstad and Watts, op. cit.

[11]"Universities Asked to Evaluate Curricula for Education Majors," Herald-Leader (Lexington: Herald-Leader Publishing Company, June 22, 1985).

Based on available information, it is obvious, then, that the secondary students are not receiving an adequate education as far as economic understanding is concerned. Further, there appears to be a need to update curricula in the universities so that teachers may be adequately prepared to teach economics at the secondary level.

CHAPTER III

PROCEDURES

In May, 1984, this writer responded to a request for proposals from the Bureau of Vocational Education, Kentucky Department of Education, by proposing that all students enrolled in vocational education programs in the five counties which composed Region IX be tested during the 1984-85 academic year for the purpose of assessing their level of economic understanding.

After receiving notice that the project was funded, contact was made with Dr. John VanSant, Director of Region IX, to request permission to administer a test to those students, with the testing site to be at the vocational schools within the five counties. Permission was granted with the understanding that this writer would personally contact each of the directors in the five counties. The schools were:

1. Morgan County Area Vocational Education Center
2. Montgomery County Area Vocational Education Center
3. Mason County Area Vocational Education Center
4. Rowan County State-Vocational Technical School
5. Lewis County Area Vocational Education Center

An order was placed with Science Research Associates, a firm which had distributed the Test for Economic Understanding during the past, for 150 copies of the test. It was later learned that SRA no longer distributed the test, and the Joint Council on Economic

Education was contacted directly. The order was placed with the Council for 150 copies of the 1977 edition of the Test for Economic Literacy.

Upon receipt of the test copies, the Director of the Rowan County State Vocational-Technical School was contacted to request permission to administer the test to the students enrolled in that institution as the initial site. At the request of Clifford Wells, the Director, the test copies and directions for administering the test were left at his office so the test could be administered at a time which was convenient for teachers and students. Completed tests were retrieved on December 10.

On December 13 the tests were taken to Montgomery County Area Vocational Education Center. Mrs. Norma Willoughby, Director, administered the tests and they were returned on December 20.

Consultation with the Director of the Mason County Area Vocational Education Center resulted in setting a test date there in February. Tests were delivered to the office of the Director, Glen Collins, on February 8, with the understanding that their counselor would administer the tests. On March 13, when the tests still had not been given at Mason County, they were retrieved and taken to Morgan County Vocational Education Center on March 19.

Mr. Willis Lyon, Director of the Morgan County school, administered the test, and completed tests were retrieved on March 21.

Tests were delivered to the office of Douglas Applegate, Director of the Lewis County Area Vocational Education Center, on April 16. After completion there, the testing materials were again taken to

Mason County on April 23 and retrieved on April 30.

On January 7, a student worker was hired to assist with the collating of data for the 795 students who were tested at the five schools.

Treatment of the Data

Mr. C. Steven Hunt, an instructor at Morehead State University, assisted in this study by utilizing a computer system for data analysis, Statistical Analysis System (SAS), producing simple univariate descriptive statistics for the numeric variables in the assessment. The General Linear Model (GLM) was used to handle the classification of discrete variables, and Tukey's studentized range (HSD) test was used to control the error rate.

CHAFTER IV

THE TEST OF ECONOMIC LITERACY

The original Test of Economic Understanding was developed in 1964 by the Joint Council on Economic Education, with the stated purpose of helping school systems to assess gains in economic knowledge through the use of a standardized, nationally normed assessment instrument.

In 1977, the Joint Council released the Master Curriculum Guide for the Nation's Schools and concurrently developed a revision of the 1964 test. The revised edition, Test for Economic Literacy, was made available in Form A and Form B.

Norming activities on the 46-question test were completed in the spring of 1977, using a population of 4,192 students for Form A and 4,468 students for Form B. Students were selected from a cross section of the nation's high school (92 in number) based on a stratified random sample. (Names and locations of schools are shown in Appendix A.) Two of the schools were located in Lexington, Kentucky--Henry Clay High School and Lafayette Senior High School.

Test Content

Questions on the test were divided into basic content categories, as follows:

A. The Basic Economic Problem

1. Economic wants
2. Productive resources
3. Scarcity and choices
4. Opportunity costs and trade-offs
5. Marginalism and equilibrium

B. Economic Systems

6. Nature and types of economic systems
7. Economic incentives
8. Specialization, comparative advantage, and the division of labor
9. Voluntary exchange
10. Interdependence
11. Government intervention and regulation

C. Microeconomics: Resource Allocation and Income Distribution

12. Markets, supply and demand
13. The price mechanism
14. Competition and market structure
15. "Market failures": information costs, resource immobility, externalities, etc.
16. Income distribution and government redistribution

D. Macroeconomics: Economic Stability and Growth

17. Aggregate supply and productive capacity
18. Aggregate demand and unemployment and inflation
19. Real and money income; price level changes
20. Money and monetary policy
21. Fiscal policy: taxes, expenditures, and transfers
22. Economic growth
23. Saving, investment, and productivity

E. The World Economy

24. International economics

F. Economic Institutions

G. Concepts for Evaluating Economic Actions and Policies

Value of the Test

The Test for Economic Literacy is valuable to educators in that it enables them to assess students' knowledge of economic concepts--students' relative strengths and weaknesses with regard to economic knowledge.

The norm data should be used only in comparing students in a given school or geographic area with others; in this case, the comparison was made with the norming population.

Data is meaningful to teachers to the extent that the composition of the norming group was comparable to that of the students in Region IX. In other words, the probability is high that the norming sample contains a random distribution by IQ, socio-economic status, and ethnic-racial mix.

Norming Sample Statistics

Statistics obtained from the testing of the 4,192 students using Form A of the Test for Economic Literacy were used for a comparison with the students tested in Region IX. Those statistics are shown in Table I below.

TABLE I

Aggregate Statistics for the Test for Economic Literacy Form A

Mean	21.59
Standard Deviation	8.52
N	4,192
S.E.M. (Standard Error of Measurement)	3.02
Cronbach Alpha	0.875

The S.E.M. (Standard Error of Measurement) provides an estimate of the variation amount which can be expected in a test score; i.e., if a student receives a score of 23 on Form A, one can be 67 percent

certain that the student's "true" score lies in a range from 20 to 26 or that there is a 95 percent certainty that the "true" score lies in a range of 17 to 29.

It is also to be noted that 55 percent of those students taking the Test of Economic Literacy had taken a course in economics. As a result,

> "...an eleventh grader with economics who obtains a raw score of 29 on Form A of the TEL is performas well as, or better than, 91 percent of all twelfth graders taking form A without economics who particpated in the norming of the TEL."[3]

The Cronbach's Alpha provides a measure of overall test reliability. It is a statistic yielding a coefficient with a value ranging from zero to 1.00. The higher the coefficient reads, the greater is the statistical reliability. If statistics result in a Cronbach Alpha of 1.00, there is an indication of a perfectly reliable test. A coefficient of zero would indicate an unreliable test. The Test of Economic Literacy produced a Cronbach Alpha of 0.875, indicating high statistical reliability.

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[3]John C. Soper, Test of Economic Literacy: Discussion Guide and Rationale (New York: Joint Council on Economic Education, 1979), p.11.

CHAPTER V

FINDINGS

This study was conducted to ascertain the level of economic literacy of those students enrolled in vocational programs in the vocational schools in Region IX of Kentucky. The assessment instrument was the Test of Economic Literacy, produced by the Joint Council on Economic Education and normed in 1977, using a nationwide sample of 4,192 students in 92 high schools. The test consisted of 46 questions designed to assess student understanding of basic economic concepts deemed essential for them to know in order to efficiently and effectively fill their present and future roles as consumers, voters, and workers.

The national mean of the 4,192 students completing the test was 21.59. Since those students tested represented a cross-section of all students in the United States, that mean was used to compare the students in Region IX with regard to their achievement level on the test.

The test was administered at five sites--four Area Vocational Education Centers and one State Vocational-Technical School. A total of 795 students completed the test. Schools were identified by number as shown in the following table.

TABLE 2

SCHOOL IDENTIFICATION

Identifying Number	Testing Site
1	Morgan County Area Vocational Education Center
2	Montgomery County Area Vocational Education Center
3	Mason County Area Vocational Education Center
4	Rowan County State Vocational-Technical School
5	Lewis County Area Vocational Education Center

Group Differences

No effort was made to ascertain whether there was a significant difference in the groups by running an analysis of their ACT scores.

Test Results

The result of the testing is shown in the following tables. They include overall statistics for all five testing sites, overall results by county, results by age groups, results by grades, results by gender, results by academic track, and results by number of relevant courses taken.

TABLE 3

OVERALL STATISTICS

Factor	Data
N	795
Mean	15.2264
Median	15
Standard deviation	4.43157
Low age group	14
High age group	19
Academic grade level	9 - 12
Academic tracks tested	3
Relevant courses taken	0 - 5
Low score	1
High score	34

TABLE 4

RESULTS BY COUNTY

Factor	County 1	2	3	4	5
N	97	237	34*	143	284
Mean	15.2748	14.4388	12.8824	16.2168	15.6479
Standard deviation	4.54318	4.11815	3.73164	4.23124	4.63616
Median	15	14	12.5	16	15
Low score	7	2	3	4	1
High score	29	26	25	28	34

*This county elected to test only seniors

TABLE 5

RESULTS BY AGE

Factor	Age Groups 14	15	16	17	18	19
N	2	57	244	353	126	13
Mean	9	15.7719	15.2336	15.4023	14.7143	13.8462
Standard deviation	1.41421	4.50404	4.1513	4.45969	4.73093	5.04721
Median	9	15	15	16	14	13
Low score	8	8	2	1	2	7
High score	10	30	25	28	34	23

TABLE 6

RESULTS BY GENDER

Factor	Male	Female
N	425	370
Mean	14.9812	15.5081
Standard deviation	4.49996	4.34067
Median	15	15
Low score	1	2
High score	29	34

TABLE 7

RESULTS BY ACADEMIC TRACK

Factor	Vocational	General	College Bound
N	461	194	140
Mean	15.0195	14.4588	16.9714
Standard deviation	4.25513	4.09863	4.99056
Median	15	14	17
Low score	4	1	2
High score	28	27	34

TABLE 8

RESULTS BY NUMBER OF RELEVANT COURSES

	0	1	2	3	4	5
N	43	341	300	101	9	1
Mean	12.5581	14.5425	16.1567	16.0099	14.4444	12
Standard deviation	3.74994	3.98033	4.55279	5.04667	2.92024	--
Median	13	14	16	16	14	12
Low score	6	4	3	1	10	12
High score	20	26	34	28	14	12

TABLE 9

MEAN BY ACADEMIC GRADE AND TRACK,
COUNTY AND GENDER

Vocational Track	Counties				
Seniors	1	2	3	4	5
Male	16.31	11.75	13.15	15.7	15.79
Female	16.58	13.6	13.33	18.82	13.06
General Education Track					
Seniors					
Male	15.0	14.28	--	19	14.6
Female	--	14.68	7.5	17	14

TABLE 9, continued

College Bound Track Seniors	Counties 1	2	3	4	5
Male	21	17	--	14	16.3
Female	18	17.6	--	19	17.75

Vocational Track Juniors	Counties 1	2	3	4	5
Male	14.29	13.76	--	15.17	16.30
Female	13.5	14.17	--	15.31	14.16
General Education Track					
Male	13.5	13.85	--	12.33	13.12
Female	11.33	14.02	--	16.33	13.38
College Bound Track					
Male	--	14.0	--	14	15.83
Female	--	14.5	--	16	17.9

Vocational Track Sophomores	Counties 1	2	3	4	5
Male	15.4	12.2	--	13.87	12.25
Female	--	--	--	13.0	14.8
General Education Track					
Male	13.0	15.4	--	14	13
Female	--	--	--	--	14.28
College Bound Track					
Male	--	15.0	--	11.0	21.2
Female	--	--	--	--	19.89

Vocational Track Freshmen	Counties 1	2	3	4	5
Male	--	--	--	16.66	13
Female	--	--	--	--	--

TABLE 10

RESULTS BY RELEVANT COURSES

Track and Factor	Number of Relevant Courses Taken 0	1	2	3	4	5
Vocational Track						
N	32	224	150	52	3	--
Mean	12.625	14.3214	15.9	16.9038	16	--
Standard deviation	3.3864	3.9028	4.4582	4.4159	3.464	--
Low score	6	4	7	4	14	--
High score	20	26	26	28	20	
General Education Track						
N	8	83	69	30	3	1
Mean	12.875	14.289	14.7971	14.8667	12.3333	12
Standard deviation	3.8706	4.0016	3.6201	5.4755	2.0816	--
Low score	6	7	3	1	10	12
High score	17	24	23	27	14	12
College Bound Track						
N	3	34	81	19	3	--
Mean	11	16.6176	17.7901	15.3684	15.0	--
Standard deviation	7.8102	3,9467	4.9823	5.7455	2.6458	--
Low score	6	8	8	2	13	--
High score	20	24	34	26	18	--

TABLE 11

COMPARISON BY AGE AND COUNTY

AGE - 14	Counties 1	2	3	4	5
N	--	1	--	1	--
Mean	--	10	--	8	--
Standard Deviation	--	--	--	--	--
Median	--	10	--	8	--
Low score	--	10	--	8	--
High score	--	10	--	8	--
AGE - 15					
N	2	26	--	6	23
Mean	19	14.23	--	14.3333	17.39
Standard Deviation	2.82843	3.82803	--	3.61478	5.02484
Median	19	14	--	14	16
Low score	17	8	--	10	10
High score	21	22	--	19	30
AGE - 16					
N	28	85	--	45	86
Mean	14.2143	14.8118	--	15.511	15.8372
Standard Deviation	4.39155	3.52033	--	4.21912	4.55518
Median	14	15	--	15	15
Low score	7	7	--	4	2
High score	24	23	--	25	26

RESULTS OF TEST QUESTION ANALYSIS

Question Number	Number Answering Correctly	Percent Answering Correctly
1	120/795	15%
2	206	26%
3	155	19%
4	364	46%
5	296	37%
6	317	40%
7	319	40%
8	426	54%
9	322	41%
10	175	22%
11	349	44%
12	224	28%
13	388	49%
14	318	40%
15	514	65%
16	358	45%
17	348	44%
18	239	30%
19	509	64%
20	199	25%
21	105	13%
22	383	48%
23	306	38%
24	358	45%
25	407	51%
26	379	48%
27	336	42%
28	278	35%
29	188	24%
30	127	16%
31	311	39%
32	310	39%
33	217	27%
34	186	23%
35	224	28%
36	324	41%
37	208	26%
38	215	27%
39	228	29%
40	245	31%
41	246	31%
42	144	18%
43	226	28%
44	218	27%
45	171	22%
46	199	25%

All test questions, with correct responses and rationale for the correct responses, are included as Appendix A, with a notation of the percent of students who gave an incorrect response to each question.

General Linear Models Procedure

and

Tukey's Studentized Range (HSD) Test

As was indicated on page 17, the General Linear Model was used to handle the classification of discrete variables, and Tukey's Studentized Range (HSD) Test was used to control the error rate. (See Appendix D for statistical information generated by the GLM and HSD.)

Findings from the statistical analysis of the GLM and HSD were:

1. The regression partials (Type III SS) indicate that there are no statistically significant differences between the students in the counties in Region IX. The F value was 1.44 and the alpha level was .21.
2. The Statistical Model explained a significant amount of variation in the Economic Literacy Score. It was statistically significant at the .05 level with PR F = .0001 and the F value = 9.29.
3. No statistically significant differences were indicated by grade level or gender within the five counties.
4. Academic track (vocational, general, or college) was found to be a significant factor in the study with a F value of 10.57. The comparison test revealed that the college-track

student, with a $\bar{X}$ score of 16.97, scored about two questions higher on the test than did the vocational-track student, whose $\bar{X}$ score was found to be 15.02. The general-track student, with a $\bar{X}$ score of 14.46, tended to score lower on the exam than any group. In comparison to the college-track students' scores, the general-track student scored approximately two and one-half questions lower. Even though the GLM indicated a significant mean, the difference between 16.97 and 14.46 was small.

5. The number of relevant courses taken by students prior to completing the Test of Economic Literacy was found to be statistically significant with a F value of 10.57 PR > F = .0001. Those students having none of the relevant courses attained the lowest scores on the test, with an $\bar{X}$ score of 12.6. Students with one relevant course had an $\bar{X}$ score of 14.54; those with two had the highest $\bar{X}$ score, 16.16; and those with three courses scored 16.01.
6. The sampling groups were small when the number of relevant courses increased to four and five; therefore, the mean of these groups were not significant.

CHAPTER VI

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

This study was conducted to attempt to ascertain the level of economic understanding of those students enrolled in vocational rograms in five vocational schools in Vocational Region IX. The Test of Economic Literacy, produced by the Joint Council on Economic Education, was used as the assessment instrument. The study was made financially possible through funding from the Bureau of Vocational Education, State Department of Education, Frankfort, Kentucky.

A total of 795 students were tested, with the cooperation of the directors of the five vocational institutions. The resulting data was analyzed through the use of a Statistical Analysis System package (SAS), with the help and cooperation of C. Steven Hunt, an instructor at Morehead State University.

The norms for Form A of the Test of Economic Literacy indicated a mean of 21.59 and a standard deviation of 8.52 for the 4,192 students tested nationally. This was in contrast to the aggregate statistics for this study, indicating a mean of 15.2264 and a standard deviation of 4.43157 for the 795 students tested.

Only two variables appeared to be statistically significant in comparing achievement of the students in Region IX: the acadmic track being followed, and the number of relevant courses taken prior to the assessment. The college-track student had a mean score of 16.97, the vocational track student had a mean score of 15.02, and the general-track student had a mean score of 14.46. Students with no relevant courses had a mean score of 12.6; those with one relevant course had a mean score of 14.54; those with two relevant courses had the highest mean score--16.16; and those with three relevant courses had a mean score of 16.01. The sampling groups for those with four and five relevant courses were too small to be significant.

Conclusions

Based on information obtained through this study, it was concluded that:

1. The students taking vocational courses in the Area Vocational Education Centers and the State Vocational-Technical School in Region IX are probably typical of all students enrolled in all Kentucky vocational schools.
2. The Test of Economic Literacy, Form A, used a norming sample which is probably typical of the population used in this study.
3. The students tested in Region IX are not as economically literate as the norming sample, with the national mean being 21.59 compared to the Region IX mean of 15.2264.

4. Although the statistical analysis indicated no significant difference between achievement by county in the study, the range of mean scores from 12.8824 in County 3 to 16.2168 in County 4 would indicate some differences in student achievement. Additional research would be needed to attempt to ascertain the differences.
5. Age group was not a significant factor. It was expected that the major number of students taking the test would be in the 16 to 17-year range, and 75 percent were in that group.
6. Gender was not a significant factor, although the female students, overall, had a mean score .5269 higher than the male students.
7. The academic track followed by the students did affect the statistics, and proved to be a significant factor. The college-bound track's mean score 2.51 points greater than the general-track indicates an area where more study may need to be done.
8. The number of relevant courses taken prior to the assessment was a significant factor in the study. More study should be undertaken to determine which courses were most beneficial.
9. With only four questions out of the 46 on the test being answered correctly by more than 50 percent of the students, reading difficulties may be involved as well as difficulties in reasoning and decision making; and lack of economic knowledge is definitely indicated.

10. There is a need for a serious evaluation of the curriculum in the public schools of Kentucky, especially as to the number of courses which would allow the infusion approach for economic education inasmuch as that is the type of economic education mandated by the state.
11. There is a need for the State Department of Education to consider including a required course such as that used by the State of Pennsylvania for economic education.

Recommendations

Based on the findings of this study, it is recommended by this researcher that:

1. Studies similar to this be conducted in a central Kentucky area and in a western Kentucky area.
2. Studies be conducted in a random sample of the comprehensive high schools of Kentucky.
3. If additional studies indicate a low level of economic literacy in other secondary educational institutions, a serious review of the curricula for the public secondary schools be conducted with a view to instituting a required course in economics.
4. Consideration be given to requiring a 36-hour program, such as the one established by the State of Pennsylvania. Since six-week computer programs are already in place in many of the schools, an economics program and an additional needed program could round out a semester of credit.

5. Teacher education institutions in the state be urged to require that all preservice teachers complete at least one course in economics.
6. Workshops and seminars be conducted to prepare inservice teachers for working with the infusion approach to teaching economics, as it is now mandated.
7. Teachers who are selected to teach economic concepts be the best qualified of the school faculty, with a major or minor in economics.
8. Consideration be given to a study of the impact of a higher level of economic literacy among the citizens of Kentucky on the economy of the state.

APPENDIX A

TEST ITEM DISCUSSION AND RATIONALE

WITH PERCENT ANSWERING QUESTIONS INCORRECTLY

ITEM DISCUSSION AND RATIONALE

Percent of students answering question INCORRECTLY shown at right of rationale. Correct answer shown in bold type and asterisked.

FORM A

ITEM	RATIONALE	Percent Answering Incorrectly
ree major factors of pro-uction are land, labor, and apital. Which of the following groups best illustrates these factors? *A. Rent, workers, and money* *B. Oil, taxi drivers, and bonds* *C. **Iron ore, clerks, and trucks.** *D. Farmers, investors, and manufacturers*	To the economist, "land" means natural resources in general, "labor" means human effort, and "capital" means productive equipment or structures, e g , machinery, tools, buildings, locomotives. Answer C is the only one that satisfactorily illustrates each of the three factors of production: land (iron one), labor (clerks), and capital (trucks). Note that "money" (in A) and "bonds" (in B) are *not* capital in the way economists use that term.	85%
2. *What is meant by the statement that every economic system (such as tradition, command, or market economy) faces the fact of scarcity?* *A. ***There are not enough productive resources to satisfy all wants of a society.*** *B. Every young society faces scarcity, but older economies overcome this problem* *C. There are times when some products can be had only by paying high prices* *D. All economies have depressions during which scarcities exist*	"Scarcity," in economics means that society has more wants than it has available resources (or means) to satisfy all those wants. This is a fundamental concept of economics and underlies the idea that ordinarily consumers, business, and government tend to choose the most effective use of limited resources, i.e., they must follow the principle of "economizing." The problem of scarcity is faced continually by every society, whatever the form of its government or economic system.	74%

ITEM	RATIONALE	Percent Answering Incorrectly
3. *The opportunity cost of a new public high school is the* *A. money cost of the new building* *B. necessary increase in the annual tax rate* * / ***C. other desirable economic goods that must be given up to build the school.*** *D. cost of constructing it now as opposed to the cost of a new school at a later date*	The opportunity cost of producing anything is the goods or services that might alternatively have been produced with the same resources. In other words, opportunity cost refers to what is forgone once one uses money or real resources for a specific purpose.	81%
4. *Which of the following questions is faced by all economic systems (i.e., tradition, command and market)?* *A. How will corporations be organized?* *B. How can markets be kept competitive?* * / ***C. What goods and services will be produced?*** *D. How will governments protect private property?*	No economic system can escape the problem of choosing which mix of goods and services to produce. However, each type of economic system makes such choices in a distinctive way. Traditional economic systems decide mainly by custom or habit what goods and services will be produced. Command economies do so mainly by the decisions of a central planning authority. Market economies decide mainly through the price signals received by producers selling in competitive markets.	54%
5. *In a market economy, the purpose of profits is to* *A. get businesses to act in a socially responsible manner* * / ***B. persuade businesses to produce what consumers demand.*** *C. provide funds to pay workers better wages* *D. redistribute income from poor to rich*	Relatively high profits in a competitive market economy will induce producers to increase output and/or will attract additional producers. Relatively low profits will discourage production of added output and/or will induce some firms to leave an industry that shows low profits. Barriers to entry or exit in a particular industry may inhibit the process of adjusting output to the amount of consumer demand.	63%
6. *Which of the following is the most essential for a market economy?* *A. Functioning labor unions* *B. Good government regulation* * / ***C. Active competition in the marketplace.*** *D. Responsible action by business leaders*	Active competition in the marketplace is essential for the effective operation of a market economy. Competitive markets force business firms to produce the products consumers demand at the lowest prices that will cover costs. Although the factors mentioned in the other answers may help a market economy to work well, such an economy could function without any of them.	60%

ITEM	RATIONALE	Percent Answering Incorrectly
7. *Specialization and exchange within a nation or between nations is likely to have which of the following effects?* *A All costs of production will rise* * / ***B. More goods and services can be produced.*** *C The danger of economic instability is reduced* *D The independence of both nations and individuals is increased*	When individuals, businesses, or nations specialize in doing what they can do best and exchange their respective products, the total quantity of goods and services for which there is demand will increase. The danger of economic instability may, however, actually increase as a result of increased specialization, and the independence of both nations and individuals will decrease—i.e., *inter*dependence will increase.	60%
8 *Within a market economy a coastal state harvests a great quantity of fish, an inland state has a productive beef cattle industry. If exchanges of fish and beef take place between these states* *A one cannot determine gains or losses from the given information* *B one state gains at the expense of the other* *C both states lose* * / ***D. both states gain.***	Both states gain because both states benefit from specialization and exchange. The fact that more than one exchange of fish for beef takes place rules out all other answers, for if a state did not benefit, there would be no incentive for it to participate in additional exchanges.	46%

ITEM	RATIONALE	Percent Answering Incorrectly
9 *Suppose a large city is investigating the elimination of rent controls on housing at a time when the vacancy rate is extremely low—only 1% of all apartments in the city are vacant. Which of the following is most likely to occur if rent controls are eliminated?* *A. A decrease in rents and a decrease in the supply of housing.* ★ ***B. An increase in rents, perhaps followed later by an increase in the supply of housing.*** *C. An increase in the demand for housing, followed by a decrease in the supply of housing.* *D. No change in rents, since price controls are usually set where supply and demand intersect.*	**Rent controls while vacancy rates are low set prices (rents) which are below equilibrium prices. When the controls are removed, rents will rise to the market-clearing level. The higher rents are likely to induce builders and property owners to increase the supply of rental housing over time.**	59%
10 *Of the following which is the most general cause of low individual incomes in the United States?* ★ ***A. Lack of valuable productive services to sell.*** *B. Discrimination against nonunion employees.* *C. Unwillingness to work.* *D. Progressive tax rates.*	**Most individuals earn their income from wages or salaries—payments for the productive services they render. Low individual incomes generally reflect the fact that the people affected—often because of lack of educational and technical skills—do not have productive services to sell that are valued highly by potential employers. The other answers may account for some low incomes, but A provides the most general reason.**	78%
11 *The demand for a factor of production depends largely on* *A. the supply of the factor.* *B. the supply of other factors of production.* *C. the demand for other factors of production.* ★ ***D. the demand for the product or products which it helps produce.***	**Producers combine factors of production in the proportions needed to produce the goods and services they seek to sell. What they seek to produce is determined by what is demanded in the marketplace. Thus, the demand for a productive factor is a *derived demand*, depending largely on the market value of the good or service it helps to produce.**	56%

ITEM	RATIONALE	Percent Answering Incorrectly
12. *In a market economy, the public interest is served even when individuals pursue their own private economic goals, because of* * J **A. the operation of competitive markets.** B. *the social responsibility of business leaders* C. *careful planning and coordination of market activity* D. *individuals who understand what is in the public interest*	In a market economy, the desire of business owners to make profits and the desire of workers to obtain higher wages lead to the production of those goods and services consumers want most. A market economy relies on competition to assure that if consumer demand goes up, increased output is supplied at the lowest prices that will cover all costs of production and still leave a reasonable profit. Thus, competitive markets play a more central role than any of the forces in the other answers.	72%
13. *If consumers are to exercise their freedom of choice wisely in a market economy, they must* A. *know where and when products are produced* * J **B. know the prices of alternative products available.** C. *know whether a product was produced by a monopolist* D. *have sufficient income to permit them to purchase whatever they choose*	When consumers know the relative prices of alternative products, they can determine which combination of purchases will satisfy them best at the lowest total cost.	51%
14. *Teen Power, a teenage organization, proposed that the minimum wage for teens should be increased. What effect would this increase most likely have on teen wages and employment in a market economy?* A. *Wage rates would go up and teen employment would go up* B. *Wage rates would go down and teen employment would go up* * J **C. Wage rates would go up and teen employment would go down.** D. *Wage rates would go up and teen employment would stay the same*	Since minimum wage laws are designed to raise wages above their market-determined rates, teen wages would go up but teen employment would most likely decline. Reduced teen employment may be caused by several factors: (1) employers may find it cheaper to substitute machinery for some teenage workers; (2) employers may be able to hire older, more experienced workers at the higher wage; (3) some employers of teens may have to curtail operations because of the higher wage costs.	60

ITEM	RATIONALE	Percent Answering Incorrectly
15. *According to the "law of supply and demand," if twice as many heads of lettuce were grown this year because of good weather as were grown last year* *A. the supply of lettuce would stay the same this year* *B. the demand for lettuce would go down this year* ★ ***C. the price of lettuce would go down this year.*** *D. the price of lettuce would go up this year*	**All other things remaining the same, an increase in market supply will in general lower the price of each unit supplied. The greater the increase in supply, the greater the fall in price. Because of the fall in price, however, the quantity demanded should be larger.**	35%
16. *The price of shoes is likely to be increased by* *A. new machines reducing the cost of shoe production* *B. more capital investment by producers* *C. a decrease in the demand for shoes* ★ ***D. a decrease in the supply of shoes.***	**This is another example of how price is determined by supply and demand in competitive markets. A decrease in the supply of shoes with demand unchanged will tend to raise their price. The factors referred to in the other answers would tend to lower the price of shoes.**	55%
17. *Assume that the demand increases for bread produced by many competitive firms. The resulting rise in the price of bread will usually lead to* ★ ***A. more being produced.*** *B. less being produced* *C. no change in production* *D. elimination of inefficient businesses from the market*	**A rise in the price of bread resulting from increased demand in a competitive market will generally lead to the production of more bread. Bakers will see the opportunity to sell more loaves at the higher price and therefore will try to meet the increased demand so as to enlarge their profits.**	56%

ITEM	RATIONALE	Percent Answering Incorrectly

Questions 18 and 19 are based on the following table

State Tax Table

Income	Percentage Rate	Tax Amount Minimum	Tax Amount Maximum
$ 0-1000	0	$ 0	$ 0
$1001-2000	10	$100	$ 200
$2001-3000	20	$400	$ 600
$3001-4000	30	$900	$1200

18 *The tax in the table above is a*

A proportional income tax
★ ✓ ***B. progressive income tax.***
C regressive income tax
D fixed income tax

Since the *rate* of taxation increases as income increases, the tax in the table is progressive. A proportional income tax is one whose rate remains constant as income changes, and a regressive tax is one whose rate falls as income increases. A fixed income tax (if one existed) would presumably have a constant *amount* of tax, independent of income. Such a tax would be regressive.

70%

19 *Using the information in the table above, we know that as income increases the rate of taxation*

★ ✓ ***A. increases and the amount of tax increases.***
B increases and the amount of tax decreases
C decreases and the amount of tax increases
D decreases and the amount of tax decreases

As income increases, both the *rate* of taxation and the *amount* of the tax increase, and these are the hallmarks of a progressive tax.

36%

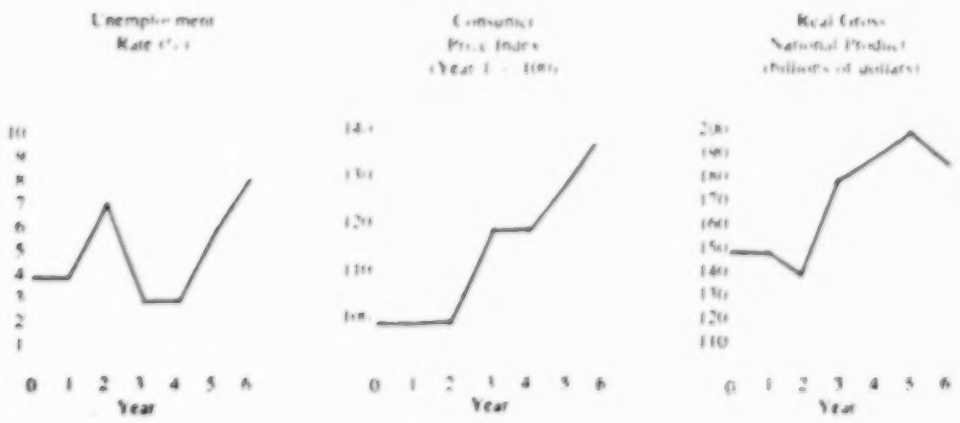
ITEM	RATIONALE	Percent Answering Incorrectly
20. *You read the following headline: "COFFEE GROWERS FORM MONOPOLY." How will the new coffee monopoly most likely differ from a highly competitive coffee growing industry?* *A. Profits in the coffee industry will now be certain* *B. The coffee growers will increase their use of capital goods* *C. The coffee growers will increase output and hire more workers* ☆ ***D. There will be less incentive for the coffee growers to be efficient.***	**A monopolized industry differs from a competitive one because a monopoly (or cartel) generally places production or marketing limits on each member and also imposes a minimum price on the product. There is thus little or no market incentive for the members of a monopoly (or cartel) arrangement to be efficient. Answers B and C are inappropriate because of the restrictions on output. Answer A is inappropriate because profits in the coffee industry depend upon many factors and the formation of a monopoly or cartel will not guarantee high profits.**	75%
21. *If you saw a newspaper headline that read, "ACME WIDGET CORPORATION RAISES PRICES, REST OF WIDGET INDUSTRY EXPECTED TO FOLLOW," you would know that Acme Widget Corporation was most likely to be in an industry with* *A. one seller* ★ ***B. few sellers.*** *C. many sellers* *D. total regulation*	**An industry with comparatively few sellers (but more than one) is called an oligopolistic industry. Price-setting behavior in such an industry frequently involves "price leadership" by one firm, with the other firms following. Firms in such an industry cannot assume that their price-setting activities will not influence other firms in the industry. If Acme raises its prices but the rest of the industry does not follow, Acme will lose customers to its (few) competitors and will be forced to reduce its prices to the level prevailing in the industry.**	87%
22. *The supply of a product increases at the same time the demand for it falls. In the absence of other changes its price* *A. cannot be determined* *B. will stay the same* *C. will rise* ☆ ***D. will fall.***	**Either an increase in supply or a decrease in demand alone would generally lead to a lower price in the absence of counteracting forces. If they occur together, a lower price is bound to follow.**	52%

ITEM	RATIONALE	Percent Answering Incorrectly
Questions 23 and 24 are based on the following information *Smog in the Central City area is largely caused by automobile exhaust fumes. The smog problem could be virtually eliminated if approximately 100 air-purification plants were built in the area. These plants would simply draw in smog-filled air, remove the smog, and pump the clean air back into the Central City atmosphere. It is estimated that the cost of operating each plant would be $10,000 per year.*		
23. *It is highly unlikely that private business firms would build and operate the plants and sell their services directly to individual residents of the Central City area because* *A. the cost of operating the plants would be too great* *B. people are unlikely to be willing to pay for smog-free air* *C. it would be less costly for the government to build and operate the plants than for private business firms to do so* * *D. it would probably be impossible to provide smog-free air to those who are willing to pay for it while withholding it from those who refuse to pay.*	Since the only possible way to get all the residents of an area to pay for removing smog from the air is through taxation, only a government authority with taxing power is likely to erect air-purification plants. "Cleaned up air" in this case is a *public good*, that is, one whose benefits cannot be restricted to those who pay the costs of providing it. Such goods and services are therefore usually paid for by some form of general taxation, for example, clean air, paved streets, police protection.	62%
24. *Suppose that the government of Central City were to build and operate the air-purification plants. From the standpoint of achieving efficiency in the allocation of economic resources, which of the following taxes should be increased to provide the additional tax revenues needed to finance the operation of the air-purification plants?* * *A. Motor vehicle fuel.* *B. General sales* *C. Property* *D. Income*	A tax on motor fuel—a "user fee" for polluting the air—would have two desirable effects from the standpoint of allocative efficiency: it would make those who are causing the pollution pay the costs of cleaning it up, and it would reduce the amount of smog somewhat since the tax would raise gasoline prices, thus tending to reduce the quantity of gasoline consumed.	55%

ITEM	RATIONALE	Percent Answering Incorrectly
25 *The total output of the economy is bought by which of the following three large groups of spenders?* A *Farmers, laborers, and householders.* B *Corporations, households, and investors.* C *Investors, speculators, and manufacturers.* ☆ **D. Consumers, business firms, and governments.**	**Economists typically divide the economy into consumers, business firms, and governments, the three major groups that buy the total output of the economy. The other responses are all only partial listings of those who buy.**	49%
26 *The best single measure of the total economic output in the United States is the* A *consumer price index.* ☆ **B. gross national product.** C *total amount of take-home pay.* D *index of industrial production.*	**The gross national product is the total value of all final goods and services produced in a nation during a given time period. The other measures cover only particular aspects of an economy's operation.**	34%

Questions 27, 28, and 29 are based on the following graphs.

PARKLAND GRAPHS



27. *Parkland had both rising unemployment and a high rate of inflation during which period?* A. *Years 1-2* B *Years 2-3* C *Years 3-4* ☆ **D. Years 4-5.**	**In years 1-2, unemployment rose but the Consumer Price Index (CPI) remained steady. In years 2-3, unemployment fell, and the CPI rose. In years 3-4, the unemployment rate was steady and so was the CPI. Only in years 4-5 did *both* unemployment and prices rise simultaneously.**	58%

	ITEM	RATIONALE	Percent Answering Incorrectly
	28. *Parkland had an increase in output with a relatively low inflation rate during which period?* *A. Years 1-2* *B. Years 2-3* * ✓ ***C. Years 3-4.*** *D. Years 4-5*	In years 1-2, output (real gross national product) declined while prices remained steady. In years 2-3, output rose sharply, but the price level also increased considerably. In years 4-5, output increased but prices again rose markedly. Only in years 3-4 did output increase without a substantial increase in the price level.	65%
	29. *What is the economic situation and the most appropriate monetary and fiscal policies during years 1-2?* *A. Unemployment is falling, a budget deficit and or easy money policy is needed* * ✓ ***B. The economy is in a recession; a budget deficit and/or easy money policy is needed.*** *C. Inflation continues and accelerates, a budget surplus and or tight money policy is needed* *D. Unemployment is rising while inflation accelerates, a budget surplus and or easy money policy is needed*	In the period covering years 1 and 2, unemployment increased sharply (from 4 to 7 percent) while the CPI remained roughly constant (at a level of 100) and real output fell by roughly $10 billion (from $150 billion to $140 billion). The combination of rising unemployment and falling real GNP is a typical sign of an economy in a recession. Many economists consider that a recession is in progress when real output falls for at least two consecutive quarters. The so-called neo-Keynesian policy stance under such conditions would call for a budgetary deficit and/or an "easy" monetary policy. Answer A is incorrect because unemployment is rising, not falling, answers C and D are incorrect because inflation is constant, not accelerating. Moreover, under D, the policy mix of a budget surplus *and* easy money would be self-canceling.	76%
	30. *Which of the following groups is typically hurt the most by unexpected inflation?* *A. Farmers* *B. Debtors* * ✓ ***C. Lenders.*** *D. Manufacturers*	Of the groups listed, lenders are typically hurt most by unexpected inflation since they are later repaid a fixed sum of money that has less buying power than it had when the loan was made. Moreover, lenders may well have made the loan at lower interest rates than those they would have charged after an unexpected inflation had taken place.	84
	31. *The commercial banking system creates money when banks* *A. sell bonds to the public* * ✓ ***B. extend loans to the public.*** *C. increase loans to the Federal Reserve System* *D. purchase bonds from the Federal Reserve System*	When banks in the commercial banking system loan money to the public, they typically do so by crediting the checking accounts of the borrowers. Money is literally "created" in this process.	61%

ITEM	RATIONALE	Percent Answering Incorrectly
32. *The functions of money are to serve as* *A. a determinant of capital spending and aggregate supply.* * ✓ ***B. a unit of account, a medium of exchange, and a store of value.*** *C. a determinant of investment, consumption, and aggregate demand.* *D. a stabilizing force, a means of income redistribution, and a resource allocator.*	As a unit of account, money serves as the common denominator in which all prices are expressed. As a medium of exchange, money is acceptable as a means of payment for the purchase of virtually any good or service. As a store of value, money on hand that is not spent on current purchases may be retained for purchases that might be made in the future.	61%
33. *The limit of an economy's real output at any time is set by* * ✓ ***A. the quantity and quality of labor, capital, and natural resources.*** *B. business demand for final goods and services.* *C. government regulations and spending.* *D. the amount of money in circulation.*	While all the items listed may influence the amount of an economy's real output at any specific time, the upper limit is set by the quantity and quality of its real resources—labor, capital, technology, and natural resources. Business demand, the amount of money in circulation, or government spending may help to increase real output but the ceiling on output is set by the real resources available for production.	73%
34. *The Federal Reserve Board generally tries to increase the money supply when it wants to* *A. hold down the government debt.* *B. increase the government debt.* * ✓ ***C. fight unemployment.*** *D. fight inflation.*	The Fed generally tries to increase the money supply when it wants to fight unemployment. An increase in the money supply usually leads to more spending (increased demand) and greater spending generally creates a need for more production which in turn increases employment. More money would tend to produce inflation rather than fight against it, so answer D is wrong. The primary function of the Federal Reserve System is to regulate the supply of money in the economy and to maintain monetary and credit conditions that are favorable to stable economic growth at high employment. While these Federal Reserve activities may at times indirectly affect the government debt, this result is incidental to its main purpose. Therefore, answers A and B are incorrect.	77%

ITEM	RATIONALE	Percent Answering Incorrectly
35. *To experience economic growth a developing country must* * ✓ ***A. increase investment.*** *B. increase consumption* *C. use the market system* *D. use central economic planning*	To economists, investment is the act of acquiring the tools, equipment, and structures needed to produce other goods and services. If investment increases, a country can usually produce more, and more production is the means of achieving economic growth. Increased consumption, use of the market system, or use of central economic planning are neither necessary nor sufficient conditions for inducing economic growth.	72%
36. *In a market economy high wages depend largely upon* *A. socially responsible business leaders* * ✓ ***B. high output per worker.*** *C. actions of government* *D. minimum wage laws*	In a market economy, what businesses can pay workers depends primarily upon the contribution the workers make to the salable output of the business. Thus, in a market economy, high wages are fundamentally due to high output per worker, although other factors have some influence.	59%
37. *Increasing the federal budget surplus is more desirable in a period of* ✓ ***A. inflation.*** *B. depression* *C. falling prices* *D. mass unemployment*	Inflation results when an economy experiences more demand for goods and services than it has capacity to produce. Under so-called neo-Keynesian policy prescriptions, an important way to relieve this condition is for the government to take in more revenues than it spends. The resulting budget surplus diminishes the amount of purchasing power in the economy and hence reduces the pressures that lead to inflation.	
38. *Often an economy operates at less than full employment. This is most likely to occur* *A. whenever competition is intense.* * ✓ ***B. when total spending is inadequate.*** *C. when there is excess demand inflation* *D. when there is a scarcity of unskilled labor*	There is likely to be unemployment of both labor and machines when individual spending for consumer goods plus business spending for materials and equipment plus government spending—that is, "total spending"—falls below the amount needed to buy all the goods and services an economy can produce. Such shortfalls are characteristic of deflation, not inflation. Scarcity of labor is typical of a *high*-employment situation.	73%
39. *If total demand declines relative to the productive capacity of the economy, which of the following is likely to occur?* *A. Inflation* *B. Increased employment* * ✓ ***C. A slower growth rate.*** *D. A government budget surplus*	A slowing in the rise of total demand implies that the productive capacity of an economy is being used less than before. This in turn implies a slower growth rate of the nation's real GNP. None of the other answers are realistic alternatives.	71%

ITEM	RATIONALE	Percent Answering Incorrectly
40 *If, when there is full employment, the federal government increases its spending without increasing its tax revenues, generally* *A an increase in unemployment will occur.* *B a serious depression will occur.* *C the national debt will decrease.* * ✓ ***D. inflation will occur.***	**Government spending without offsetting tax collections normally adds to total spending in the economy because government spending rises without a reduction in private spending. Thus, when there is full employment and total output cannot rise, additional government spending (unless accompanied by matching higher taxes) will tend to bid up prices for the available goods and services, i.e., inflation will result.**	69%
41 *Increased taxation is the preferred method of financing government spending when* *A the interest rate is low* *B corporate profits are low* * ✓ ***C. the economy is experiencing inflation.*** *D. the economy is experiencing a recession*	**Inflation implies that there is more money available than there are goods and services to spend it on. If the government increases its taxes, it withdraws funds that otherwise would by and large have been spent in the marketplace. Such an increase in taxes tends to reduce private purchasing power and allows the government to engage in public expenditures without adding to inflationary pressures**	49%
42 *Which of the following four statistics is generally accepted as the best measure of the economic growth of a nation?* *A Total employment* *B Index of stock prices* *C Money income per capita* * ✓ ***D. Real income per capita.***	**Real income per capita is the best measure of economic growth for two reasons. One is that measuring income in real terms removes the distorting effects of a changing price level. The other is that *total* income may be high or low merely because a country has many or few people, e.g., China vs. Norway. Dividing total real income by the population adjusts for such a difference.**	82%
43. *For most nations, the reduction of tariffs would probably* * ✓ ***A. force some workers out of jobs in protected industries.*** *B lessen job opportunities in export industries.* *C. lower the average level of living.* *D. injure most farmers.*	**Tariffs are often established in order to insulate a domestic industry from imports brought in from countries that can make and sell the product more cheaply. The reduction of such tariffs would probably force some workers in the protected industries out of their jobs.**	72%

	ITEM	RATIONALE	Percent Answering Incorrectly
44	*One advantage of the corporate form of business organization is that* *A. corporations do not pay taxes* *B. stockholders make larger profits* * / ***C. stockholders have limited liability.*** *D. corporations are larger than other forms of business*	Stockholders in a corporation cannot be sued or held liable for more than the worth of their ownership in the corporation. Any other assets they may hold are exempt from such suits or claims. Hence, corporation stockholders are said to have "limited liability." Its existence helps to increase capital formation since investor risk is reduced.	73%
45	*A national system of free medical care for the aged poor is established. The system is paid for by an increase in the income tax. These actions promote one economic goal, but work against another. Specifically, these actions are likely to* *A. reduce security but promote efficiency.* *B. reduce equity but promote efficiency.* *C. reduce stability but promote growth.* * / ***D. reduce freedom but promote equity.***	This question involves a trade-off between freedom and equity, two economic goals of the United States. Economic freedom is reduced by the increase in the income tax. Since all taxpayers are taxed more in order to help the aged poor, the taxpayers' economic freedom is curtailed because they no longer have the taxed dollars to spend or save as they wish. On the other hand, equity (a more equal distribution of income and/or welfare) is promoted because the aged poor are given access to medical care that they could not otherwise obtain in the quantites they desire. Whether or not such a system is "desirable" is not in question here. One must be able to identify which economic goals are in conflict in the given situation.	78%
46	*Labor unions in the United States have* * / ***A. strengthened the bargaining position of unionized workers in relation to their employers.*** *B. greatly increased the wages of union workers compared to non-union workers.* *C. organized a majority of the American labor force.* *D. increased competition in the labor market.*	When workers organize into labor unions, their strength in bargaining with employers over wages and working conditions generally increases. There is some evidence that answer B is also partially correct, but the differences appear to be small and not independent of the general economic health of the industry involved. In any event, this effect is less pervasive than that indicated by option A. Answer C is wrong because less than one-quarter of American wage earners are unionized. Answer D is wrong because unionization reduces competition among workers in a given labor market.	75%

Source: Test of Economic Literacy: Discussion Guide and Rationale, Joint Council on Economic Education, 1977

APPENDIX B

TESTEE DATA SHEET

PLEASE PROVIDE THE FOLLOWING INFORMATION

NAME_____
Last First Middle

AGE_____

GRADE (check one)

_____12th

_____11th

_____10th

_____ 9th

SEX (check one)

_____Male

_____Female

ACADEMIC TRACK (check one)

_____Vocational

_____General

_____College Bound

IN WHICH PROGRAM ARE YOU ENROLLED AT THE VOCATIONAL SCHOOL?

_____

WHICH OF THE FOLLOWING COURSES HAVE YOU TAKEN? (Please check)

_____General Business

_____General Math

_____Algebra I

_____Algebra II

_____Consumer Education

_____Economics

Thank you for participating in this research project.

APPENDIX C

SCHOOLS THAT PARTICIPATED IN THE NORMING OF TEST FOR ECONOMIC LITERACY

SCHOOLS THAT PARTICPATED IN THE NORMING OF
TEST FOR ECONOMIC LITERACY

ALABAMA
- Dothan High School
  Dothan 36301

ARKANSAS
- Parkview High School
  Little Rock 72204

CALIFORNIA
- Soquel High School
  Soquel 95-73

COLORADO
- John F. Kennedy High School
  Denver 80227
- South High School
  Denver 80210
- Widefield High School
  Security 80911

CONNECTICUT
- Mary Immaculate Academy
  New Britain 06063
- Sheehan High School
  Wallingford 06492

FLORIDA
- DeLand Senior High School
  Deland 32720
- Lakeland Senior High School
  Lakeland 33803
- Mainland Senior High School
  Daytona Beach 32015
- Seabreeze Senior High School
  Daytona Beach 32015

GEORGIA
- Columbus High School
  Columbus 31902
- Wayne County High School
  Jesup 31545

HAWAII
- Kaimuki High School
  Honolulu 96816

IDAHO
- Capitol High School
  Boise 83704

ILLINOIS
- Alton Senior High School
  Alton 62002
- Canton Senior High School
  Canton 61520
- Dundee High School
  Carpentersville 60110
- Evergreen Park High School
  Evergreen Park 60642
- Hampshire High School
  Hampshire 60140
- Homewood-Flossmoor High School
  Flossmoor 60422
- Jacobs High School
  Algonquin 60102

INDIANA
- Central High School
  Elkhart 46514
- Elkhart Memorial High School
  Elkhart 46514
- Jay County High School
  Portland 47371
- Richmond Senior High School
  Richmond 47374
- Simtown High School
  Elkhart 46514

IOWA
- Ar-We-Va Community High School
  Westside 51467
- Fort Dodge High School
  Fort Dodge 50501

KENTUCKY
- Henry Clay High School
  Lexington 40502
- Lafayette Senior High School
  Lexington 40503

LOUISIANA
- Southwood High School
  Shreveport 71108

MARYLAND
- Dulaney Senior High School
  Timonium 21093
- High Point Senior High School
  Beltsville 20705

MASSACHUSETTS
- Medford High School
  Medford 02155
- West Springfield High School
  West Springfield 01089

MINNESOTA
- Business Learning Center
  St. Paul 55101
- Cooper High School
  New Hope 55428
- Roosevelt High School
  Minneapolis 55406

MISSOURI
- Hickman High School
  Columbia 65201
- Hillcrest High School
  Springfield 65803
- Purdy High School
  Purdy 65734

MONTANA
- Custer County District High School
  Miles City 59301

NEBRASKA
- Grand Island Senior High School
  Grand Island 68801

NEW HAMPSHIRE
- Merrimack Valley High School
  Penacook 03301

NEW JERSEY
- East Orange High School
  East Orange 07017
- Hopewell Valley Central High School
  Pennington 08534
- Pennsauken High School
  Pennsauken 08110
- Union High School
  Union 07083

NEW YORK
- Byram Hills High School
  Armonk 10504
- Farmingdale Senior High School
  Farmingdale 11735
- Grover Cleveland High School
  Brooklyn 11237
- LaSalle Senior High School
  Niagara Falls 14302
- Northport High School
  Northport 11768
- Town of Webb High School
  Old Forge 13420

NORTH CAROLINA
- Cummings High School
  Burlington 27215
- East Senior High School
  Kernersville 27284
- Grimsley High School
  Greensboro 27408
- North Forsyth High School
  Winston-Salem 27105
- Page Senior High School
  Greensboro 27405
- Parkland High School
  Winston-Salem 27104
- R.J. Reynolds High School
  Winston-Salem 27104
- West Forsyth High School
  Clemmons 27012

NORTH DAKOTA
- Red River High School
  Grand Forks 58201

OHIO
- East Tech High School
  Cleveland 44104
- McKinley Senior High School
  Canton 44702
- Timken Senior High School
  Canton 44702

OKLAHOMA
- Ponca City High School
  Ponca City 74601

OREGON
- Corvallis High School
  Corvallis 97330
- Crescent Valley High School
  Corvallis 97330
- Harrisburg Union High School
  Harrisburg 97446
- Parkrose High School
  Portland 97220

PENNSYLVANIA
- Carlisle Senior High School
  Carlisle 17013
- Emmaus High School
  Emmaus 18049
- Lower Moreland Senior High School
  Huntindon 19006

SOUTH CAROLINA
- Spring Valley High School
  Columbia 29206

SOUTH DAKOTA
- Roscoe High School
  Roscoe 57471
- Huron High School
  Huron 57350

TENNESSEE
- Hamilton High School
  Memphis 38111
- Sheffield High School
  Memphis 38111

UTAH
- Sky View High School
  Smithfield 84335

VIRGINIA
- T.C. Williams Senior High School
  Alexandria 22302

WASHINGTON
- East High School
  Bremerton 98310
- John R. Rogers High School
  Spokane 99207
- Lincoln High School
  Seattle 98103
- North Central High School
  Spokane 99205
- Shadle Park High School
  Spokane 99205
- West High School
  Bremerton 98310

WISCONSIN
- Armstrong High School
  Neenah 54956
- Hamilton High School
  Milwaukee 53220
- Shorewood High School
  Shorewood 53211

APPENDIX D

GENERAL LINEAR MODELS PROCEDURE

AND

TUKEY'S STUDENTIZED RANGE (HSD) TFST

ANALYSIS

GENERAL LINEAR MODELS PROCEDURE

CLASS LEVEL INFORMATION

CLASS	LEVELS	VALUES
TRACK	3	1 2 3
No. of Prep	6	0 1 2 3 4 5

NUMBER OF OBSERVATIONS IN DATA SET = 795

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE
MODEL	7	1189.94812518	16 .9925893
ERROR	787	14403.2971578	18.30152117
CORRECTED TOTAL	794	15593.2452830	
MODEL F =	9.29		

TEST OF SIGNIFICANT MEANS

SOURCE	DF	TYPE III SS	F VALUE	Pr > F
TRACK	2	386.78991231	10.57	.0001
NO. OF PREP	5	629.58295455	6.88	.0001

TUKEY'S STUDENTIZED RANGE (HSD) TEST

NO. OF PREP COMPARISON		SIMULTANEOUS LOWER CONFIDENCE LIMIT	DIFFERENCE BETWEEN MEANS	SIMULTANEOUS UPPER CONFIDENCE LIMIT
2	-1	0.647	1.614	2.582
2	-0	1.606	3.599	5.591
3	-1	0.083	1.467	2.852
3	-0	1.226	3.452	5.677
1	-2	-2.582	-1.614	-0.647

TUKEY'S STUDENTIZED RANGE (HSD) TEST

TRACK COMPARISON		SIMULTANEOUS LOWER CONFIDENCE LIMIT	DIFFERENCE BETWEEN MEANS	SIMULTANEOUS UPPER CONFIDENCE LIMIT
3	-1	0.983	1.952	2.921
3	-2	1.399	2.513	3.627
1	-3	-2.921	-1.952	-0.983
2	-3	-3.627	-2.513	-1.399

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